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(54) **A PROCESS FOR TRANSFER PATTERN PRINTING OF A MOIST TEXTILE WEB, AS WELL AS A PATTERN CARRIER WEB FOR USE IN THE PROCESS.**

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FR-A- 1 034 816
FR-A- 1 036 510
US-A- 1 651 470
US-A- 1 783 606
US-A- 1 965 257
US-A- 1 993 524

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Description

The present invention concerns a process of the type defined in the introductory portion of claim 1 for transfer printing a moist textile web, which wholly or predominantly consists of natural fibres and/or natural-polymer fibres on the basis of cellulose. A minor part of the material may be synthetic fibres. By transfer pattern printing is understood continuous transfer of a pre-printed pattern from a pattern carrier web to the textile web, the two webs being caused to contact each other continuously in a transfer region which is frequently in the form of one or more pairs of pressure rollers. The invention also concerns an apparatus and a pattern carrier web for use in the process.

Transfer pattern printing is a technique which has been known for a long time, and which has been widely used commercially since the late fifties in particular in the form of sublimation transfer printing for use in printing on textile webs of synthetic fibres, and it involves e.g. the advantage over direct textile printing that the converters can rapidly switch the production to other patterns, so that the supplies of various designs in stock can be limited to the actual demand, while as regards direct textile printing the manufacturer will in practice often have to produce quite large supplies of the individual designs to keep the expenses per printed textile length at a reasonable level.

Another advantage of transfer pattern printing is that it is possible to obtain a quite sharp and finely detailed transfer of the patterns, which have been preprinted by means of suitable dye and with the desired fineness and sharpness on a suitable pattern carrier web.

Transfer pattern printing has been extensively used for these reasons, and the technique is abundantly described in various embodiments in the patent literature. Processes for transfer pattern printing on textile webs of synthetic fibres and/or natural fibres by wet transfer of the pattern from a pattern carrier web to the textile web by bringing the webs together, e.g. by passage through rollers, are thus known from the Danish Patent Application 5666/68, which, however, uses a pattern carrier of paper, the fibres of which have the same cellulose structure as cotton, or of silicone treated paper with which the dye has poor or no affinity. The transfer, which takes place at a very small pressure, requires considerable heating of the order of 80 to 300 °C and a typical contact time of between 90 seconds and 5 minutes. In order to reduce the contact time it is necessary to incorporate an organic solvent or turpentine in the dye. However, even with reduced contact time it is a discontinuous process. The same is the case with the Danish Patent Application 1566/69, which requires a contact time of 20 to 220 seconds and a temperature of at least 100 °C, typically up to 180 °C. The dye is mixed into a water-based paste optionally containing an organic solvent. If the process described is carried out continuously the print becomes unclear and the results consequently unacceptable. A similar process is known from the SE Patent Specification 137 674, which, hovewer, requires using as pattern carrier web a paper web coated with i.a. wheat starch, formaldehyde and a melamine resin applied in separate steps. Statably, the dye has no affinity with this coating. Further, solvent-based inks are used having a high content of white spirit, and the transfer process takes place using high pressure and heating. The aggregate process comprises many components which today would be inconceivable for use in connection with transfer printing, if only for environmental reasons.

Altogether, the known continuous processes for transfer pattern printing are generally performed using elevated temperatures and/or solvent-based inks, and in most cases special demands are made in respect of the nature of the pattern carrier web. Thus, the GB Patent Specification 1 430 831 describes a process which is carried out in a transfer chamber under high-pressure conditions at temperatures above 100 °C, thus creating a saturated steam phase which makes possible transfer of the optionally dyed layer from the temporary carrier to the textile web. GB Patent Specification 1 480 328 describes a process for transfer pattern printing on a natural fibre web using increased pressure, the process being feasible with or without heat treatment. Transfer takes place from a paper web to which dyes encapsulated in the binder are applied, and performance of the method without heating requires the presence of a solvent which is added either directly before the transfer or which is present on the pattern carrier web in the form of micro capsules together with the micro capsules containing the dye.

The FR Patent Specifications 1 034 816 and 1 036 510 describe transfer pattern printing on wetted cottons from a paper web to which water-soluble or water-disperse dyes and removable carriers have been applied. According to the former specification a water-soluble dye dispersed in a non-specified fat has been applied to the paper. In the latter specification it is mentioned that the fat may be vaseline, solid paraffin, animal or vegetable oils and fats or mixtures thereof with resin.

In both cases the transfer is effected using heat, more particularly 50 to 180 °C.

A plurality of other pulications concern transfer pattern printing using heating and/or solvent-based inks. These publications include the GB Patent Application 2 008 625, the US Patent specification 4 155 707, the EP Patent Application 0 018 708, the GB Patent Specifications 1 491 799, 1 455 292 and 1 227 271 as well

as the SE Published Application 409 125. Additionally, US Patent Specification 4 057 864 describes a continuous wet process in which the transfer is effected at at least 100 °C under increasing pressure exerted by the, in all, 9 pressure rollers running counter to the heated calender-cylinder. According to EP Patent Applications 0 001 168 and 0 032 247 elevated temperatures (80-120 °C) are also used when carrying out a continuous wet process.

The US Patent Specifications 1 651 470 and 1 783 606 mention the possibility of performing the transfer process without heating, but the former works with contact times of 1 minute or more, i.e. a non-continuous procedure, and the latter uses solvents for the dyes, preferably 50% aqueous acetone.

US Patent Specifications 1 965 257 and 1 993 524 describe continuous processes with relatively high production velocity and low contact time. Furthermore, ordinary paper can be used as pattern carrier. It is, however, a drawback of these processes that comparatively large amounts of solvents are used, and that transfer must take place at high temperature (approx. 200 °F, i.e. approx. 93 °C).

Finally, DE Patent Applications 2 710 158 and 2 702 300 describe wet processes for transfer printing, which also utilize the migration properties of the dyestuffs used by means of the action of heat, typically 100-120 °C.

Some of the above-mentioned publications mention printing on webs of natural fibres, but it is generally admitted that natural fibres, primarily wool and cotton are less suitable for dyeing through transfer of the dyestuff by transfer printing, which, as appears from the foregoing, frequently takes place at elevated temperatures. Tests have long been made with other transfer methods for dyeing natural fibre fabrics, but so far without practically useful results. While, in terms of printing technique, it has been possible to obtain good results, this has been at the expense of the softness or absorbency of the fabric, because the fabric has e.g. been impregnated with a resin which has subsequently been printed using ordinary disperse dyes. Such an impregnation, however, makes the fabric undesirably stiff arid poorly absorbing.

It has now surprisingly been found that it is possible to perform transfer pattern printing on a textile web which wholly or predominantly consists of natural fibres, primarily cotton, and/or natural-polymer fibres on the basis of cellulose, without using heat during the transfer proper and solely by using water soluble or water dispersable dyes. Hereby the environmental problems associated with use of organic solvents are avoided, these problems being particularly predominant when also employing elevated temperatures. Furthermore, the process is energy saving as no heating is required for the pattern transfer and as a web of relatively thin paper of a type being economically advantageous to manufacture may be used as pattern carrier.

This is obtained by the process of the invention which is characterized by the features set forth in the characterizing portion ore claim 1. According to the present process, the pattern carrier web is thus a web of paper or a paper-like material, more precisely a preferably coated paper with an air permeability of 0.1 to 3000 nm/Pa.s, in particular 0.5 to 1 nm/Pa.s, and a water absorption capacity corresponding to a Cobb-number lower than 50, preferably around 25. The paper is preferably coated with carboxy methyl cellulose (CMC), an alginate or an aqueous dispersion of polyethylene or polyacrylate. The paper web is printed with a pattern of one or more water soluble or dispersable dyestuffs which are mixed with a readily soluble substance. This substance acts as thickening agent in the ink, as carrier and temporary binder for the dye on the paper and as reaction component during the joining proper of the wetted textile web with the printed paper web. Finally the substance ensures that the two webs are not displaced relatively to each other during the transfer of the pattern.

Examples of water soluble dyes include substantive dyes, basic dyes, acid dyes, chrome complex dyes, and reactive dyes. The dispersable dyes include vat dyes, sulfur dyes, leuco ester vat dyes and pigment dyes.

The actual transfer of the pattern to the textile web, which has been pre-wetted (controlled moisture) takes place in that the textile web in the transfer region is squeezed together with the pattern carrier web under a suitably high linear pressure, the textile web hereby, owing to the high pressure, being compressed over a very short extent to a reduced thickness and then expanded naturally, so that the pattern is effectively sucked from the pattern carrier web to the textile web. This entire process is carried out without using heat, irrespective of the fibre and dye type used.

Examples of fibres which may be subjected to the transfer pattern printing by the process of the invention include natural fibres such as cotton, hemp, jute, flax and other plant fibres as well as wool and silk. Further, cellulose-based natural-polymer fibres may be used, such as viscose fibres. A minor part of the material may be synthetic-polymer fibres, e.g. polyester, polyamide or polyacryl.

By way of example, the process of the invention is performed in an apparatus comprising an impregnation mangle and the actual transfer- part consisting of one or two pairs of squeezing rollers. The impregnation mangle consists of a liquid trough through which the textile web runs to be wetted and a pad

nip pressing out excess liquid under a specific pressure to obtain a controlled moisture content in/on the textile web. The moisture absorbance is dependent upon fabric quality, additions to the aqueous bath, the amount of dye applied to the paper web etc. In all cases the textile web is primarily wetted with water, but to the water may be added e.g. urea which acts as a solvent for the dye and prolongs the penetration phase of the dye, and alkali, which partly has a swelling effect on cellulose fibres and partly a dissolving effect on certain dyestuffs, and the presence of which is necessary for fixation of reactive dyes. Furthermore, the dye bath may be admixed with dye and/or pigments. It has surprisingly been found that it is possible in the subsequent transfer to print the desired pattern on the coloured textile web without the ground colour and the pattern dye running into one another.

After controlled squeezing out of excess liquid to obtain the desired moisture, the moist textile web is passed from the pad mangle to another pair of squeezing rollers together with the pattern carrier web. Just before the joining the latter may be conditioned by passing through a moist haze of preferably clean water, so that the swelling reaction in the applied colour layer and consequently the colour transfer proceed even faster. The two webs are passed together through the pair of rollers where they are subjected to a linear pressure, generally of the order of 490 N/cm (50 kp/cm). The joined webs may optionally be passed further on through another set of rollers with a corresponding roller pressure. The velocity will normally be 10 to 20 m/min. or more, however not exceeding 50 m/min. Thus, the actual contact time will be approx. 0.1 sec. at a velocity of 10 m/min.

When the pattern has been transferred to the textile web, the dye is fixed, which takes place in a manner known per se in dependence upon the dye used.

As mentioned, the pattern carrier web is printed with a water soluble or dispersable dye mixed with a readily soluble carrier. A suitable material for this purpose is carboxymethyl cellulose (CMC), preferably low viscous CMC, which can optionally be admixed with synthetic thickeners and/or other additives.

The invention will now be explained more fully with reference to the drawing, in which

- fig. 1 is an outline of a complete apparatus for performing the process of the invention,
- fig. 2 is a section showing in detail the region around two pairs of rollers where the transfer takes place, and
- fig. 3 shows a pad mangle for initial wetting and optional ground colouring of the textile web and subsequent joining of it with the pattern carrier web.

In the apparatus shown in fig. 1, a textile web 2 of natural fibres, optionally mixed with artificial fibres or synthetic fibres, is introduced into a pad mangle 4 in which the web 2 is immersed in a liquid bath. When the textile web passes through a pair of squeezing rollers 8, 10, so much water is squeezed out of it that it contains a carefully defined residual moisture which will typically be 50-80%. The pressure between the rollers 8, 10 is a linear pressure of up to 50 kg/cm. It is decisive that the textile web 2 leaves the pair of rollers 8, 10 with a carefully controlled residual moisture which is determined in each individual case in view of the type of the textile web 2 and also the process conditions.

The web 2 is then joined with the printed pattern carrier web 18 which is unwound from the roll 20, and the joined webs pass through two sets of rollers 14, 16 and 15, 17 which in combination constitute the transfer region 12. The two pairs of rollers each exert a linear pressure of about 490 N/cm (50 kp/cm), and the web velocity is normally 10 to 20 m/min, but may be up to 50 m/min.

In the first pair of rollers 14, 16 a certain amount of moisture is squeezed out of the textile web, which thereby moistens the colour layer on the pattern carrier web and thus the carrier for the dye. The carrier is activated (swells) in this manner, so that the dye is pressed into (or penetrates into) the micropores of the fibres very rapidly - within fractions of a second. This effect is enhanced in that the wet fibre is first compressed and then (when leaving the nip) absorbs dye and carrier. This effect is intensified in the second pair of rollers, and then the transfer of dye and binder has been completed. In practice, more than 75% of the dye is transferred. The two webs are separated after having passed the pair of rollers 15, 17, and the paper web is wound onto the take-up roll 22.

The textile web 2 may continue through a post-treatment station 25 where a post-treatment agent in an aqueous solution, in paste form or in the form of a foam may be applied in a manner known per se to improve the fastness (washing fastness, rubbing fastness, etc.) and properties of the printed and optionally primed textile material.

After the post-treatment station 25 the textile web may by way of example be moved into an oven 28 for drying and condensation, where it is first dried to remove the residual moisture and then condensed, i.e. thermo-fixed, in the same process, so that the dye and optional post-treatment agent are caused to react completely, thereby providing the above-mentioned fastness and properties. Drying and condensation may optionally also take place in two processes, i.e. two runs of the same drying furnace. The temperature used depends upon the dye type and the composition of the post-treatment agent as well as the production

speed arid the length and the heating capacity of the drying oven. The dyestuffs printed on the textile web can also be fixed in a steam phase or in other known ways.

Finally, the textile web may be passed through a washing system (not shown), where any residual chemicals are removed.

Fig. 2 illustrates in more detail the movement of the webs 2 and 18 through the pair of squeezing rollers in the transfer region. A coating 30 of the mentioned dye mixture is shown printed on the carrier web 18, and it is shown how the textile web is compressed between the rollers 14 and 16, so that the coating 30 is then pressed into the surface of the textile web 2. A certain amount of free liquid will occur in front of the pair of rollers in the hatched area 32, in an enlarged scale, said liquid being squeezed out of the wet web 2 by the pair of rollers. This liquid activates the carrier contained in the print coating 30, so that the dye contained therein together with the carrier substance will immediately then be pressed into the surface of the textile web 2 while said web is compressed noticeably. After the pair of rollers 14, 16 the two webs pass another pair of rollers 15, 17, as described above, and then the two webs 2 and 18 are separated again. The web 2 has now been provided with the transferred print pattern 36.

Finally, fig. 3 shows another possible embodiment of the process, where the initial adjustment of the moisture of the textile web 2, joining of the textile web 2 with the pattern carrier web 18 and the actual transfer printing take place in the same roller system. When having passed the liquid trough 6, the wetted textile web 2 passes through the nip 8 and 10 whose mutual pressure regulates the moisture. The pattern carrier web 18 is unwound from the roll 20 and is joined with the web 2 between the rollers 10 and 14. Transfer printing takes place in two steps (between the rollers 10 and 14 and between the rollers 14 and 16), and then the webs are separated again. The paper web freed of the pattern is wound onto the roll 22, while the textile 2 with printed pattern proceeds for further treatment.

The invention is illustrated more fully by the following examples.

Example 1

According to the invention, transfer printing is performed with pre-bleached cotton linen weighing approx. 200 g/m^2. The printing paste used has the following composition:

Substantive dye, e.g. Indosol® Blau SF-GL	20 g
Urea	50 g
Sequestring agent	1 g
Sodium carboxymethyl cellulose	100 g
Synthetic thickener	20 g
Demineralized water up to	1000 g

The printing paste is applied to a paper web in an arbitrary pattern on a machine of a type which is generally used for printing transfer paper and for direct printing of textiles. The printed paper is dried at approx. 100 °C and may then be stored for 6-24 months depending upon the storage conditions.

Prior to the pattern transfer proper the textile web is wetted, e.g. in a pad mangle containing demineralized water, optionally admixed with a dye fixing agent. Where a coloured ground is desired, the liquid may contain approx. 2 g/kg substantive dye, e.g. Indosol® Rubinole SF-RG, instead, the cationic fixing agent is left out. Excess liquid is squeezed out between a pair of rollers, so that the moisture content of the textile web is 75-80%.

The textile web thus wetted and the pattern carrier web are joined in a first pair of rollers at a linear pressure of 40-45 kg/cm, whereafter the joined webs pass through a second nip of rollers at a corresponding linear pressure. Immediately thereafter the paper web (which is now wound up) and the textile web are separated. The latter, now printed with the coloured pattern, is passed on to a drying and fixing oven, in which the dye and the optionally added fixing agent are fixed in one or two runs, either at 170-180 °C for 30 seconds or for approx. 1 minute at 130 °C. Subsequent washing out may be omitted.

The resulting colouring of the cotton fibres is fine and even with sharp contours and good washability similar to what can normally be achieved when dyeing or printing with the same dye.

Example 2

A pigment dye is used in this example for printing a pattern on a woven quality of cotton and polyester 66/33; weight approx. 250 g/m^2. The printing paste used has the following composition:

Colour pigment, e.g. Pigmatex® Red 2B/60419	20 g
Natural thickener, e.g. Na-CMC	100 g
Synthetic thickener, e.g. Carrier 925	20 g
Demineralized water up to	1000 g

This printing paste is printed on a web of paper or paper-like material as stated in example 1. The printed paper is dried at approx. 100 °C and may then be stored for 6-24 months depending on the storage conditions.

The textile web is wetted by spraying with an aqueous solution consisting of a synthetic thickener, a binder, e.g. on the basis of acrylate and/or melamine, an auxiliary fixing agent, a weak base such as ammonia water, demineralized water, colouring pigment (e.g. Pigmatex® yellow 2GL/60458) and optional additives. Where a white ground is desired, the pigment dye is left out.

Moisture absorption is controlled to 80%.

The coloured pattern is printed on the textile web as stated in example 1. The linear pressure on both roller pairs is 412 N/cm (42 kp/cm).

Immediately following the transfer pattern printing proper, surface post-treatment may be effected by applying an aqueous paste or foam e.g. containing a minor amount of binder, a catalyst, an auxiliary fixing agent and a softening substance.

The still moist textile web with the printed pattern is the passed on to an oven or stenter frame to be dried and condensed in one or two runs as stated in example 1.

The resulting textile is fine with an even print and good washability and well-suited e.g. for furnishing fabrics.

Example 3

Transfer printing is performed on knitwear of cotton (225 g/m²) or a single jersey (160 g/m²). Both qualities must be carefully pre-bleached and optionally selvage glued. Printing is performed with a two-colour pattern.

Printing paste 1:	
Reactive dye, e.g. Remazol® Rot RB	50 g
Sequestring agent	1-2 g
Buffer (to pH 6.0-6.5)	1-2 g
Natural thickener, e.g. Na-CMC	80 g
Sodium alginate NV from CHT	12 g
Emulgator	0-5 g
Demineralized water up to	1000 g

Printing paste 2:	
Reactive dye, e.g. Remazol® Druckmarineblau RR	80 g
Sequestring agent	1-2 g
Buffer (to pH 6.0-6.5)	1-2 g
Natural thickener, e.g. Na-CMC	75 g
Sodium alginate NV from CHT	12 g
Emulgator	0-5 g
Demineralized water up to	1000 g

The printing pastes are applied to a paper web in an arbitrary pattern as stated in example 1. Drying is at 130 °C after which the paper may be stored for 6-18 months.

The textile web is wetted in a pad mangle with demineralized water containing no more than 10 weight-% urea and small amounts of sodium alginate, sodium hydroxide and sodium carbonate as additives. After wetting, the textile web is pressed to a moisture content of 75%.

The dye transfer from the pattern carrier web to the wetted textile web takes place in the above-mentioned two roller pairs at a linear pressure of 392 and 412 N/cm (40 and 42 kp/cm), respectively. The velocity is approx. 15 m/min.

The printed textile web is then dry-fixed in a thermo-fixing oven by means of hot air (150 °C for 3 minutes or 175 °C for 1.5 minutes).

After finishing the textile in a manner known per se fine general finenesses are achieved which are quite as good as those obtainable by direct printing. In addition the fabric gets a soft and comfortable finish.

Example 4

A two-coloured pattern is to be applied to viscose-knitwear (approx. 300 g/m²). The knitwear is pre-treated and selvage glued in a manner known per se to ease the passage through the transfer system. The two printing pastes have the following composition:

Printing paste 1:	
Reactive dye, e.g. Drimarene® rot R-4BL	25 g
Sequestring agent	1-2 g
Buffer (pH 6.5)	1-2 g
Natural thickener, e.g. Na-CMC	100 g
Sodium alginate NV from CHT	15 g
Emulgator	0-5 g
Demineralized water up to	1000 g

Printing paste 2:	
Reactive dye, e.g. Drimarene® violet R-2RL	40 g
Sequestring agent	1-2 g
Buffer (pH 6.5)	1-2 g
Low viscous Na-CMC	90 g
Sodium alginate NV from CHT	15 g
Emulgator	0-5 g
Demineralized water up to	1000 g

The chosen pattern is printed on the paper web as already stated and may then be stored.

The textile web is wetted with the dye bath described below in a mini-fluid pad mangle to a liquid absorption of 65%:

Urea	50 g
NaOH-solution (38 ° Bé)	4-8 g
Na_2CO_3	2-4 g
Na-alginate	3-5 g
Demineralized water up to	1000 g

The transfer is effected by passage through two roller pairs as stated above. The linear pressure is 392 and 441 N/cm (40 and 45 kp/cm), respectively.

The knitwear web thus printed is steam fixed in a transfer calender, which instead of the usual carrier felt is provided with a steam-impermeable (optionally teflon-coated) carrier, which when revolving about the heated cylinder together with the still moist textile web, generates a narrow steam chest between cylinder and carrier, whereby the dye penetration and the fixing are prolonged and the fixing yield increases by as much as 20%. The knitwear is then finished in a manner known per se.

Altogether, fixing of the dye applied in accordance with the invention may be effected in various ways depending on the dye type printed on the carrier and on the types of machines available. Dependent on the method of fixing chosen, it is possible to vary the additives added to the dye bath. In case of reactive dyes as used in the examples 3 and 4 it is thus possible to

1) moisten the textile web with demineralized water, optionally admixed with urea, and after the dye transfer only to dry the textile web at approx. 110 °C;
2) moisten the textile web and subsequently fix the dye in saturated steam phase, e.g. at 102 °C for 3-8 minutes;
3) leave out NaOH in the dye bath prior to the dye transfer, dry the textile web at approx. 120 °C and subsequently treat the printed textile web with a strongly alkaline, saline liquid and let it rotate for 2-24 hours or
4) leave out NaOH in the dye bath, optionally admix a larger amount of thickener and after the dye transfer submerge the textile web in an alkaline, saline bath (95-100 °C). The textile is then washed and finished in a manner known per se.

Claims

1. A process for transfer pattern printing of a moist textile web consisting wholly or predominantly of natural fibres and/or natural-polymer fibres on the basis of cellulose which may contain a small amount of synthetic-polymer fibres, wherein a pre-printed pattern carrier web is caused to continuously contact the textile web, the pre-printed pattern on the pattern carrier web being transferred to the textile web during said contact, **characterized** by using as pattern carrier web a web of paper on which there is pre-printed a pattern of a water soluble or dispersable dye admixed with a readily soluble carrier having temporary binder effect, said carrier being carboxymethyl cellulose or sodium carboxymethyl cellulose, moving the textile web to the region where the transfer takes place in a controlled wetted state after wetting with water optionally containing a dissolved or dispersed dye, and transferring the pattern from the pattern carrying web to the wetted textile web by compression of the two webs between one or more pairs of rollers under a suitable linear pressure of up to 490 N/cm (50 kp/cm) while passing through the rollers at a velocity of 10 to 50 m/min., preferably 10 to 20 m/min., so that the transfer can take place without using heat, the textile web being subjected over a short extent to compression to a reduced thickness followed by a natural expansion, so that the pattern is effectively sucked from the pattern carrier web to the textile web.

2. A process according to claim 1, **characterized** in that prior to transfer pattern printing, the textile web may be ground coloured with an aqueous dye solution during the controlled wetting.

3. A pattern carrier web for use in the process of claim 1, **characterized** in that it consists of readily absorbing paper with a water absorption corresponding to a Cobb number below 50, preferably coated, which has been printed with a dye pattern consisting of a water soluble or dispersable dye admixed with a readily soluble carrier, said carrier being carboxymethyl cellulose or sodium carboxymethyl cellulose.

4. A pattern carrier web according to claim 3, **characterized** in that the paper has an air permeability of 0.1 to 3000 nm/Pa.s, preferably 0.5 to 1 nm/Pa.s, and a water absorption corresponding to a Cobb-number around 25.

5. A pattern carrier web according to claim 3 or 4, **characterized** in that the paper is coated with carboxymethyl cellulose, alginate or an aqueous dispersion of polyethylene or polyacrylate.

Patentansprüche

1. Verfahren zum Muster-Übertragungsbedrucken eines feuchten Textilgewebes, das ganz oder vorwiegend aus Naturfasern und/oder Natur-Polymer-Fasern auf der Basis von Zellulose, welche einen geringen Anteil an synthetischen Polymer-Fasern enthalten kann, besteht, worin ein vorgedrucktes Muster-Trägergewebe kontinuierlich mit dem Textilgewebe in Kontakt gebracht wird, und das vorgedruckte Muster auf dem Muster-Trägergewebe während dieses Kontakts auf das Textilgewebe übertragen wird,
gekennzeichnet durch
Verwendung eines Papiergewebes als Muster-Trägergewebe, auf welches ein Muster vorgedruckt ist aus wasserlöslicher oder dispergierender Farbe, welche mit einem leicht löslichen Träger vorgemischt ist, der den Effekt eines zeitweiligen Bindemittels hat, wobei der Träger Carboxy-Methyl-Zellulose oder Natrium-Carboxymethyl-Zellulose sein kann,

Bewegung des Textilgewebes in einem geregelten feuchten Zustand nach der Befeuchtung mit Wasser, welches wahlweise eine gelöste oder dispergierende Farbe enthält, in die Region, in welcher die Übertragung stattfindet und
Übertragung des Musters von dem das Muster tragenden Gewebe auf das befeuchtete Textilgewebe durch Zusammenpressen der zwei Gewebe zwischen einem oder mehreren Walzenpaaren unter einem geeigneten linearen Druck von bis zu 490 N/cm (50 kp/cm) während des Hindurchführens durch die Walzen bei einer Geschwindigkeit von 10 bis 50 m/min, vorzugsweise 10 bis 20 m/min, so daß die Übertragung ohne Verwendung von Wärme stattfinden kann, wobei das Textilgewebe über einen kurzen Bereich einer Kompression auf eine reduzierte Dicke ausgesetzt wird, der eine natürliche Expansion folgt, so daß das Muster effektiv von dem Muster-Trägergewebe auf das Textilgewebe gezogen wird.

2. Verfahren nach Anspruch 1,
dadurch gekennzeichnet,
daß das Textilgewebe vor dem Muster-Übertragungsdrucken während des geregIten Befeuchtens mit einer wäßrigen Farblösung grundkoloriert werden kann.

3. Muster-Trägergewebe zur Verwendung im Verfahren nach Anspruch 1,
dadurch gekennzeichnet,
daß es aus Papier mit einer Wasserabsorption korrespondierend zu einer Cobb-Nummer unter 50 besteht, welches vorzugsweise beschichtet ist und welches mit einem Farbmuster bedruckt ist, das aus einer wasserlöslichen oder dispergierenden Farbe besteht, die mit einem leicht löslichen Träger vorgemischt ist, wobei der Träger Carboxymethyl-Zellulose oder Natrium-Carboxymethyl-Zellulose ist.

4. Muster-Trägergewebe nach Anspruch 3,
dadurch gekennzeichnet,
daß das Papier eine Luftdurchlässigkeit von 0.1 bis 3000 nm/Pa.s, vorzugsweise 0.5 bis 1 nm/Pa.s und eine Wasserabsorbtion korrespondierend zu einer Cobb-Nummer um 25 herum aufweist.

5. Muster-Trägergewebe nach Anspruch 3 oder 4,
dadurch gekennzeichnet,
daß das Papier mit Carboxymethyl-Zellulose, Alginat oder einer wässrigen Dispersion aus Poyethylen oder Polyacryl beschichtet ist.

Revendications

1. Procédé de transfert d'un motif imprimé sur un lai de textile humide, constitué totalement ou de manière prépondérante de fibres naturelles et/ou de fibres de polymères cellulosiques naturels, qui peuvent contenir une faible proportion de fibres de polymères synthétiques, dans lequel un lai de support de motif préimprimé est mis en contact continu avec le lai de textile, le motif préimprimé sur le lai de support de motif étant transféré sur le lai de textile pendant ledit contact, caractérisé en ce que l'on utilise, comme lai de support de motif, un lai de papier sur lequel est préimprimé un motif formé d'un colorant soluble ou dispersible dans l'eau, mélangé avec un support facilement soluble, ayant un effet liant temporaire, ledit support étant la carboxyméthylcellulose ou la carboxyméthylcellulose sodique, on déplace le lai de textile dans la zone où le transfert a lieu, dans un état d'humidité contrôlée, après humidification avec de l'eau contenant éventuellement un colorant dissous ou dispersé, et l'on transfère le motif depuis le lai de support de motif sur le lai de textile humidifié, par compression des deux lais entre une ou plusieurs paires de cylindres sous une pression linéaire appropriée allant jusqu'à 490 N/cm (50 kp/cm), le passage entre les cylindres, qui tournent à une vitesse de 10 à 50 m/min., de préférence 10 à 20 m/min, étant réalisé ainsi de façon que le transfert puisse s'effectuer sans utiliser de chaleur, le lai de textile étant soumis à une faible compression suivie d'une expansion naturelle, de sorte que le motif est aspiré de manière efficace depuis le lai de support de motif sur le lai de textile.

2. Procédé selon la revendication 1, caractérisé en ce que, avant le transfert du motif imprimé, le lai de textile peut subir une opération de teinture de base à l'aide d'une solution aqueuse de colorant pendant l'étape d'humidification contrôlée.

3. Lai de support de motif destiné à être utilisé dans le procédé selon la revendication 1, caractérisé en ce qu'il est composé d'un papier revêtu de préférence, absorbant facilement, ayant une capacité d'absorption d'eau correspondant à un indice de Cobb inférieur à 50, portant un motif imprimé coloré constitué d'un colorant soluble ou dispersible dans l'eau, en mélange avec un support facilement soluble, ledit support étant la carboxyméthylcellulose ou la carboxyméthylcellulose sodique.

4. Lai de support de motif selon la revendication 3, caractérisé en ce que le papier présente une perméabilité à l'air de 0,1 à 3000 nm/Pa•s, de préférence 0,5 à 1 nm/Pa•s, et une capacité d'absorption d'eau correspondant à un indice de Cobb d'environ 25.

5. Lai de support de motif selon la revendication 3 ou 4, caractérisé en ce que le papier est revêtu de carboxyméthylcellulose, d'alginate ou d'une dispersion aqueuse de polyéthylène ou de polyacrylate.

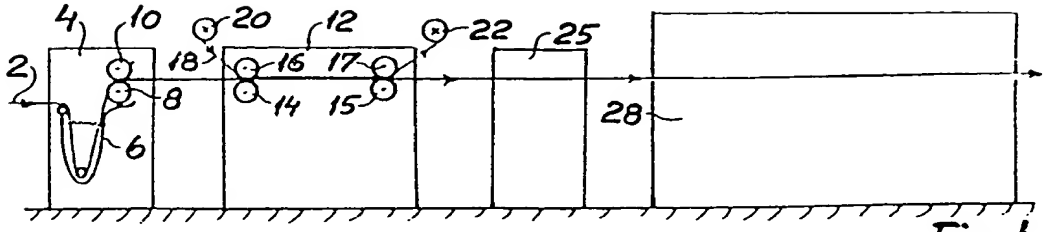

Fig.1

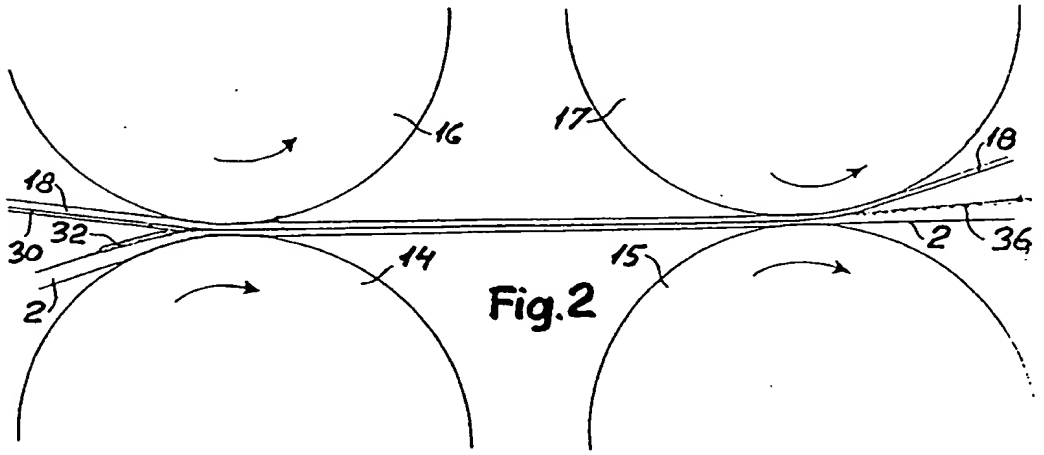

Fig.2

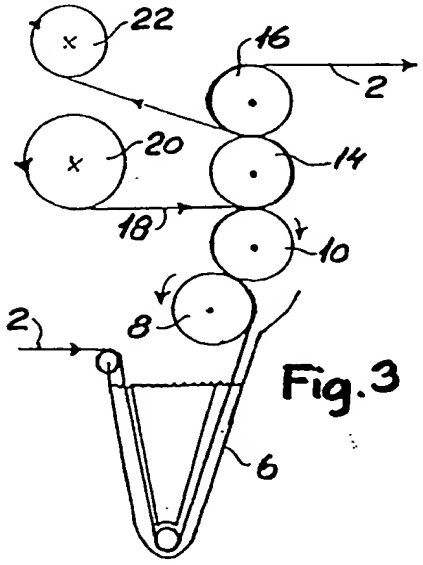

Fig.3